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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHAN, CHRISTOPHER T	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/507,243	COLAS ET AL.	
	Examiner	Art Unit	
	Christopher Chan	2109	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☒ Claim(s) *1-2, 7, 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 September 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/10/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The instant application having Application No. 10/507243 has a total of 9 claims pending in the application; there is 1 independent claim and 8 dependent claims, all of which are ready for examination by the examiner.

Oath/Declaration

2. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in **37 C.F.R. 1.63.**

Priority

3. As required bye **M.P.E.P. 201.14(c)**, acknowledgement is made of applicant's claim for priority based on applications filed on March 15, 2002 (France 02/03257).

Information Disclosure Statement

5. As required by **M.P.E.P. 609(C)**, the applicant's submissions of the Information Disclosure Statement dated September 10, 2004 is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending. As required by **M.P.E.P 609 C(2)**, a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.

Specification Objections

6. The disclosure is objected to because of the following informalities: The term "installation" is objected due to its uncommon use in the art of networks. For the purpose of examination, the examiner respectfully interprets an "installation" as a node or any equivalent term in the art, depending on the functionality of the claimed invention (router, switch, terminal, etc.). The phrase "useful-data field" is also objected to for its vague meaning under the American English language due to the term "useful" in the phrase. For the purpose of examination, the examiner respectfully interprets a "useful-data field" as the applicant's specification suggests (the payload data field of the encapsulated packet). The applicant is requested to choose American words and phrases that define the above terminology clearly. The phrase "dichotomy search" is also objected as it is uncommonly used in the networking art and is vaguely described in the specification. The Examiner respectfully interprets it to be a "comparison search" for the purposes of examination. Appropriate correction is required.

Additionally, the disclosure is objected to for not being in the preferred format as described immediately below:

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in

upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Drawing Objections

7. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because Figure 1 will require the labels "Installation I" and "Installation II" to be replaced should the applicant correct the specification objection for the term "Installation" above.. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

8. Claims 1-2, 7, and 9 are objected to because of the following informalities:

Regarding Claim 1, the phrase "useful-data field" and term "installation" are objected to as per its usage in the specification described above. The term "grid" is also objected to due to its vague definition when used alone as a term. For the purpose of examination, the Examiner respectfully interprets it as a "grid network" or "computing grid" or any equivalent phrase used in the networking art.

The term "governing" is objected to for being unclear as to what the governing entity is. A method is a series of steps and cannot govern a format from it is predetermined to be. For the purpose of examination, the Examiner respectfully interprets the "governing" of the claimed format as "utilizing." Appropriate correction is required.

Regarding Claim 2, the phrase "dichotomy procedure" is objected to as per the usage of "dichotomy search" in the specification described above. The Examiner respectfully interprets it as a comparison-based procedure.

Regarding Claims 7 and 9, the term "installation" is objected to as per its usage in the specification as objected to above.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 1-9 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding Claims 1-9, Applicant has claimed a method of selecting and sorting packets within the framework of Ethernet networks with the use of directories in the preamble to these claims without implementing such claims on any physical device; this can imply that Applicant is claiming a algorithm in a software and protocol-based domain, per se, lacking the specific hardware necessary to realize any of the underlying functionality. Therefore, claims 1-9 can be directed to non-statutory subject matter as computer algorithms, per se, i.e. the descriptions or expressions of an algorithm, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer network algorithms do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer network program that describes an algorithm is a computer element which defines structural and functional interrelationships between the computer network

program and the rest of the computer network which permit the program's functionality to be realized, and is thus statutory.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 1, the lines "including one physical layer destination address, assigned to a first destination address and *another* assigned to a second level protocol identifier" and "a second level destination address is assigned to a second destination address, and including one *other* assigned to a third level protocol identifier" (first and second paragraphs following the preamble respectively) renders these limitations vague and indefinite. It is not completely clear to the Examiner as to what "another" or "other" refers to. It appears to the examiner that "another" and "other" refers to a portion on the service level information field and will be used for the purpose of examination. Applicants might consider amending claim 1 to address the above issues.

Regarding claims 2-9 they are dependent upon claim 1 and are therefore also indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,938,736 (hereinafter Muller et al.) in view of Stevens (TCP/IP Illustrated, Volume 1: The Protocols).

Regarding Claims 1-4, Muller et al. teaches of a multi-layer switch search engine embodied in a high speed Ethernet switch employing random access memory and content addressable memories (Col. 2, Lines 55-63; Ethernet switch will inherently be packet transmission based and capable of handling multiple independent Ethernet interfaced endpoints and nodes) configured to accept and transmit Ethernet packets from one Ethernet network to another (Col. 4, Lines 5-11). Muller et al. also teaches the TCP/IP protocol stack protocol structure where there are four distinct multiple layers (Col. 1, Lines 19-26; layer 1 – physical layer, layer 2 – data link layer, layer 3 – network layer, layer 4 – transport layer, therefore the notion of a first level protocol, second level protocol, and a third level protocol) and having the invention's architecture capable of handling message traffic using the Internet suite of protocols such as TCP, IP, Ethernet, MAC (Col. 3, Lines 9-18). The basic functionality of Muller et al. shows it is capable of

receiving Ethernet encapsulated packets, modifying packet headers, storing it in memory, requesting forwarding decisions from the switch fabric block, and then forward the packet to an output port based on the forwarding decision (Col. 4, Lines 35-54; there exists a reading of information fields on the received Ethernet packets with the linking of them to specific reception ports based on the forwarding decision).

Furthermore, Muller et al. teaches of having a multi-layer distributed network element (MLDNE) in the disclosed invention utilizing memory in the form of a database with an address table used for matching with the headers of received packets to identify forwarding attributes to specific input/output ports (Col. 3, Lines 30-52; the service information fields of packets will be checked and compared against with a directory with multi-layer capabilities, thus lower and higher level elements can be embodied. Fig. 2 – 140; there are several switching subelements, each with a database or directory). During packet header processing, a packet is portioned (and encapsulated under Ethernet during a network to network transmission through the switch) into several portions; the L2 portion has a MAC source address (SA) and MAC destination address (DA) field and the L3 portion may comprise an IP flag/fragment offset field, IP source or payload portion, IP destination field, and TCP source/destination ports (Col. 9, Lines 34-55; multiple levels of useful-data and service information fields are exhibited, along with fragmentation handling capabilities for packets of longer messages due to well-known MTU size restrictions). Arbiters processes the packets one stage (and protocol level) at a time, starting with the MAC SA and MAC DA (Col. 10, Lines 19-29; the search engine will develop a key, or assignment link, due to these addresses) and moves onto the L3

portion in relation to the encapsulation method of the L2 portion (Col. 10, Lines 31-40). By doing so, both the L2 and L3 headers can have their own class type set up in programmable registers, or memory (that can be used in a database table form) such that only one header class will match for any given packet and search keys are generated (Col. 10, Lines 41-49; L2 and L3 is essentially three levels with the MAC, IP addresses, and TCP ports and the taught method will do match searching in a multi-layer manner due to search keys and header classes, or essentially allocated message descriptors).

Muller et al. additionally teaches of using the generated and modifiable search keys for the L2 and L3 databases (Col. 11, Lines 61-67; Content Addressable Memories that store the logical databases can be a plurality of directories or embodied on one memory) such that they match with certain associative and associated data dependent on the type of packet entry (Col. 12, Lines 25-44; these are fields such as the MAC addresses, IP addresses, TCP ports, class field types, etc.) and then using the data to provide indication of the output port to which the packet may be forwarded to (Col. 12, Lines 48-67, Col. 13, Lines 1-24; thus, there can be port assignments of multiple layers based on the data included on the packet headers along with the ability of forwarding to ports of a lower layer level even though a higher layer level exists, as seen in Col. 14, Lines 34-40). The flow of the port assignments during the header class searching process is also done in a sequential way such that there will be a L2 class search continuing onwards to L3 if there is a match, otherwise if a L3 class is not found on the packet header, the forwarding decision will be done on the L2, essentially rejecting the

packet for any L3 class type (Col. 13, Lines 45-67; directory element searches based on class type and packet rejections for levels without the proper header fields on the encapsulated packet. This also shows a search for matches following a "dichotomy" procedure in previously ordered lists amongst the established databases on a plurality of subelements that maintain elements that pertain to lower and higher level source/destination addresses).

In respect to Claims 1-4, Muller et al. teaches the above set forth except for the claimed multi-level protocol identifiers on the partitioned packet and the explicit identification of incoming packet fragments not having any destination address information. Stevens teaches of such encapsulated Ethernet packets (as used in Muller et al.) wherein there are protocol identifiers and useful-data related to a first, second, and third level (2.2 & Fig. 2.1; an IP datagram is encapsulated in a 802.2/802.3 or Ethernet framed packet with the type field of 0800, well-known to be IP version 4, and there is a CRC, or cyclic redundancy check, to validate that the frame and the network identifiers it contains are proper. 3.2 & Fig. 3.1 and 17.3 & Fig 17.1; the IP datagram includes the TCP header and TCP data along with its own IP header that helps with fragment offsets). Additionally, Stevens teaches of the TCP/IP protocol readily capable of handling fragmented packets received due to MTU restrictions and the process of comparison and the IP header having its own identification field, flag field ("more fragments" bit), fragment offset field, and total length field (11.5. - IP Fragmentation; as all fragments maintain a sequentially ordered identification number, packet fragments without addresses, but under the IP or UDP layer, can still be reconciled even though

they all arrive independently). Since it has been well established that Muller et al.'s disclosed invention directly pertains to the TCP/IP protocol stack in its implementation, it would have been obvious to one of ordinary skill at the time the invention was made to allow Muller et al. to execute the same features taught by Stevens, who describes the TCP/IP protocol in full. Multi-layered, encapsulated packets in an Ethernet network with fragmentation resolving capabilities have been well established in the art of networks.

Regarding Claim 5, Muller et al. together with Stevens taught the method as claimed in claim 1, wherein the method is applied within the framework of Ethernet networks with packets respecting a first level protocol of MAC type and a second level protocol of IP type (Col. 3, Lines 9-18; MAC address and Ethernet LAN standard used. Col. 4, Lines 5-18; switching Ethernet packets between Ethernet networks), and wherein each element of the directory of lower level addresses holds at least one particular value of the MAC destination address field and one particular value of the IP destination address field (Col. 12, Lines 25-44; associative data collected on the databases can have entry characteristics, including MAC and IP destination addresses for search key matching).

Regarding Claim 6, Muller et al. together with Stevens taught the method as claimed in claim 1, wherein the method is applied within the framework of Ethernet networks with packets respecting a first level protocol of MAC type imposing, among the service fields of a packet, a field identifying the protocol respected by the packets at the

second level and a second level protocol of IP type (2.2. Ethernet and IEEE 802 Encapsulation – Figure 2.1; Ethernet framework with MAC and IP types making up a first level and second level), characterized in that each element of the directory of lower level addresses holds at least one particular value of the MAC destination address field, one particular value of the IP destination address field (Col. 12, Lines 25-44; associative data collected on the databases can have entry characteristics, including MAC and IP destination addresses for search key matching) and a flag for invalidating the particular value of the IP destination address field in case of non-recognition of an IP type second level protocol (Col. 13, Lines 14-16; even though there is a IP address under a L3 entry available, indicating it is IP type, it can be invalidated or override indicated to use the L2 entry result, or MAC address).

Regarding Claim 7, Muller et al. together with Stevens taught the method as claimed in claim 1, wherein the method is applied within the framework of a duplicate network consisting of two independent Ethernet networks each having access to the installation (Col. 4, Lines 5-18; a switch moving Ethernet packets between Ethernet networks, wherein there must be at least two nodes or networks for a switch to function as defined), each of the two Ethernet networks having packets respecting a first level protocol of MAC type and a second level protocol of IP type, and within the framework of installations is able to identify the network or networks of origin of a packet (2.2. Ethernet and IEEE 802 Encapsulation – Figure 2.1; Ethernet framework with MAC and IP types making up a first level and second level), characterized in that each element of

the directory of lower level addresses holds at least one particular value of the MAC destination address field, one particular value of the IP destination address field, an identifier of the network or networks of origin of the packet compatible with these particular values of MAC and IP destination address field, and a validation flag for the identifier of the network or networks of origin of the packet (Col. 12, Lines 25-44; associative data collected on the databases can have entry characteristics, including MAC and IP source/destination addresses stored memory which will identify previous and next-hop networks under a header class for search key matching).

Regarding Claim 8, Muller et al. together with Stevens taught the method as claimed in claim 1, wherein the method is applied within the framework of Ethernet networks with packets respecting a first level protocol of MAC type imposing, among the service fields of a packet, a field identifying the protocols respected by the packets at the second level, a second level protocol of IP type and a third level protocol belonging to a group of protocols containing the UDP and TCP protocols (2.2. Ethernet and IEEE 802 Encapsulation – Figure 2.1; Ethernet framework with MAC and IP types making up a first level and second level. 17.3 – Figure 17.1 & 11.1 – Figure 11.1; TCP and UDP are encapsulated under the IP datagram, which is encapsulated under the Ethernet framework), characterized in that each element of the directory of higher levels holds at least one particular value of destination port UDP/TCP address field and a double flag for validating the particular value of destination port UDP/TCP address field identifying at the same time a third level protocol compatible with said particular value of

destination port UDP/TCP address field (Col. 12, Lines 25-44; associative data collected on the databases can have entry characteristics, including MAC, IP source/destination addresses and TCP/UDP destination port addresses for search key matching, wherein this case would have to be a double search key due to two different protocols used under the L3 entry type).

Regarding Claim 9, Muller et al. together with Stevens taught the method as claimed in claim 1, wherein the method is applied within the framework of a duplicate network consisting of two independent Ethernet networks each having access to the installation (Col. 4, Lines 5-18; a switch moving Ethernet packets between Ethernet networks, wherein there must be at least two nodes or networks for a switch to function as defined), each of the two Ethernet networks having packets respecting a first level protocol of MAC type, a second level protocol of IP type and a third level protocol belonging to a group of protocols containing the UDP and TCP protocols (2.2. Ethernet and IEEE 802 Encapsulation – Figure 2.1; Ethernet framework with MAC and IP types making up a first level and second level. 17.3 – Figure 17.1 & 11.1 – Figure 11.1; TCP and UDP are encapsulated under the IP datagram, which is encapsulated under the Ethernet framework), and within the framework of installations able to identify the network or networks of origin of the packet (Col. 6, Lines 47-55; MAC source address on entering packets), characterized in that each element of the directory of higher levels holds at least one particular value of destination port UDP/TCP address field, a double flag for validating the particular value of destination port UDP/TCP address field

identifying at the same time a third level protocol compatible with said particular value of destination port UDP/TCP address field, an identifier of the network or networks of origin of the packets that are compatible with this particular value of destination port UDP/TCP address field, and a validation flag for the identifier of the network or networks of origin of the packet (Col. 12, Lines 25-44; associative data collected on the databases can have multiple entry characteristics, including MAC, IP source/destination addresses and TCP/UDP destination port addresses for search key matching, wherein this case would have to be a double search key due to two different protocols used under the L3 entry type).

Conclusion

12. See the enclosed *Notice of References Cited* for a list of prior art that are considered pertinent to the applicant's disclosure but not explicitly relied upon in this action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Chan whose telephone number is (571) 270-1927. The examiner can normally be reached on Monday-Friday from 9AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Pwu, can be reached on 571-272-6798. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher Chan

June 22, 2007